# APPENDIX C
# SUPPLEMENTAL TURF INFORMATION

## C-1. Major warm-season grasses.

*a. Bahiagrass (Paspalum notatum).* Bahiagrass is an excellent choice for roadsides and other unimproved areas in the warm, coastal areas of the South. Its extensive root system provides an excellent means of erosion control as well as resistance to drought. It is fairly tolerant to salt injury and thrives in infertile, deep, sandy soil. Under low management it is difficult to mow because of numerous seed heads which form a tall, open turf. Bahiagrass is propagated by seed. Establishment rate is usually slow, although some cultivars establish more quickly.

*b. Bermudagrass (Cynodon dactylon).* Bermudagrass is very adaptable in areas with full sun. In the southern regions, it has a prominence similar to that of Kentucky bluegrass in the northern regions. Bermudagrass is vigorous, withstands heavy use and is resistant to disease and saline soils. It responds well to good cultural practices and must be restrained at its borders. It may be established by seed, sprigs or sod. Some popular Bermudagrass cultivars are excellent for heavy-use, high-maintenance areas such as golf greens, fairways and ballfields. These cultivars must be propagated vegetatively by sprigging or sodding. Common Bermudagrass may be seeded. The species has a coarser texture and is less winter-hardy than its cultivars. Common Bermudagrass is widely used for unimproved areas and may be used for semi-improved areas depending upon the quality of turf desired. Its bronzy seed spikes can be controlled by regular mowing.

*c. Centipedegrass (Eremochloa ophiuroides).* Centipedegrass is slow-growing, short, dense grass which establishes readily and requires little care. It does best in sandy soils in full sun or semishade in the warm coastal regions of the South. It is not tolerant to saline conditions.

*d. St. Augustine (Stenotaphrum secundatum).* St. Augustine is a coarse-textured grass useful for lawn areas in the South. It is the most shade-tolerant of the warm-season grasses and it is also tolerant to saline conditions. Although the species is relatively inexpensive to establish, it has high maintenance requirements. St. Augustine requires frequent watering and fertilization. St. Augustine is more subject to insect and disease damage than Bermudagrass; however, some cultivars offer more disease resistance.

*e. Zoysia (Zoysia spp.).* Zoysia is adapted to areas throughout the southeastern United States for use on lawns and golf courses. Its tolerance to salt makes it well adapted to coastal areas. It is a wear-tolerant species; however, once damaged it is slow to recover. Zoysia is very slow to establish and cover an area. Although close and frequent mowing is necessary, other maintenance requirements are low. Figure C-1 illustrates regional adaptation of warm-season grasses.

## C-2. Major cool-season grasses.

*a. Bentgrass (Agrostis spp.).* Bentgrass is a very fine, elegant grass especially suited to the northern half of the United States. It is used extensively for recreational areas such as golf courses; however, it demands frequent maintenance. It is tolerant to acid soil conditions and prefers full sun. Because of its maintenance demands, it is not desirable for general use.

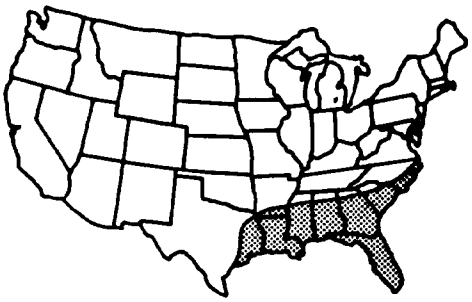
*b. Canada bluegrass (Poa compressa).* Canada bluegrass is primarily valued for its ability to control erosion on sites with sterile soils. It adapts to the vigorous climate of the Great Lakes region and can be used in shade.

*c. Kentucky bluegrass (Poa pratensis).* Kentucky bluegrass is an excellent lawn grass for areas in the northern United States. It is the most widely used of the cool-season grasses because it is adaptive to a wide range of soil and climate conditions. Kentucky bluegrass sod is very tough and may be used in semi-improved and unimproved areas such as physical training areas, airfields, parks, cemeteries and open lawn areas. It is very sensitive to close cutting (less than 1½ inches) and it is subject to summer dormancy during stressful periods of high heat and drought. It can be propagated by seed or vegetatively.

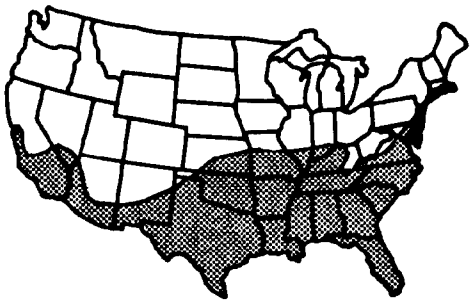
*d. Chewings and red fescue (Festuca rubra).* These fine textured grasses are well adapted to dry, shady areas in the Northeast and Northwest regions of the United States. They are generally low-maintenance grasses; however, fertilizing is necessary where tree roots and turf compete for nutrients. They mix well in equal proportions with Kentucky bluegrass to provide a dense, continuous turf for lawns.

*e. Tall fescue (Festuca arundinacea).* Tall fescue is a coarse-textured, unattractive grass, usually not desired for use as a lawn. The grass is very resistant to heavy use, high temperatures and drought. It roots deeply and provides good erosion control in sandy soils.

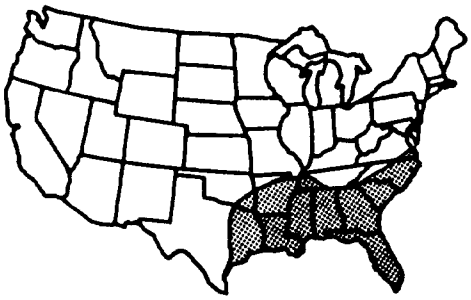
*f. Perennial ryegrass (Lolium perenne).* Perennial ryegrass is best suited to mild, maritime climates. It produces a coarse, tough turf which is not usually desired for lawn purpose. It germinates and establishes itself



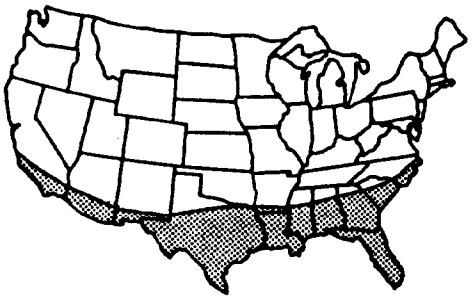
**Bahiagrass**



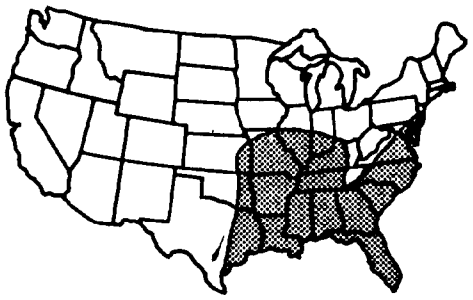
**Bermudagrass**



**Centipedgrass**



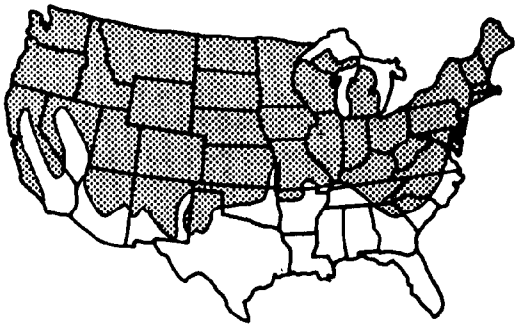
**St. Augustinegrass**



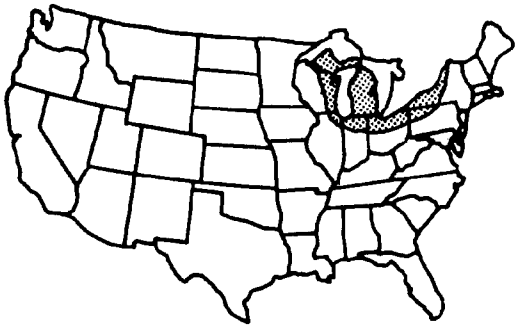
**Zoysia**

*Figure C-1. Regional adaptation of warm-season grasses.*

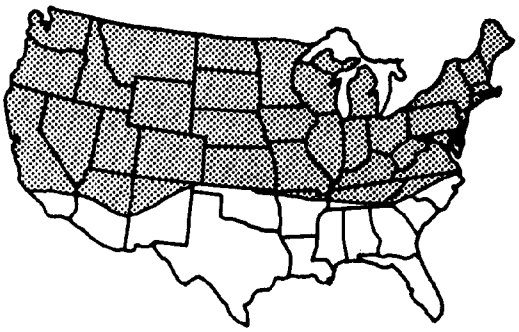
itself quickly and requires fairly frequent mowing. It is not advocated for general use, although it may be useful in shady areas where other grasses cannot survive. There are many fine-leaved ryegrass cultivars, making it a very popular grass. Figure C-2 illustrates regional adaptation of cool-season grasses.



**Bentgrass**

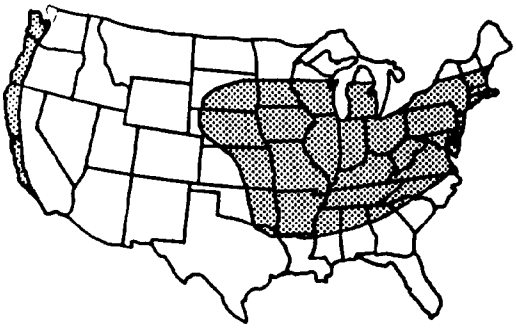


**Canada Bluegrass**

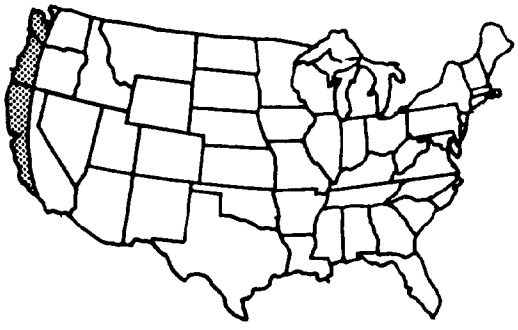


**Kentucky Bluegrass**

**Chewings & Red Fescue**



**Tall Fescue**



**Perennial Ryegrass**

*Figure C-2. Regional adaptation of cool-season grasses.*

## C-3. Major transition-zone grasses.

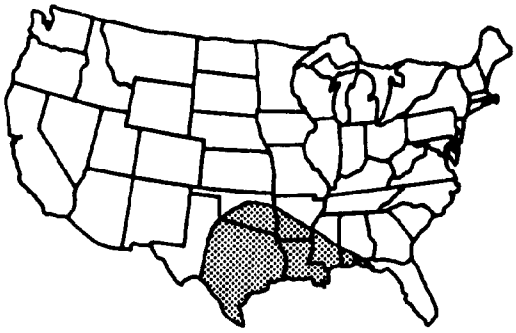
*a. Bentgrass (Agrostis spp.).* Used primarily for golf and putting greens, bentgrass has high maintenance requirements and is not recommended for general use in the transition zone.

*b. Bermudagrass (Cynodon dactylon).* Bermudagrass may be used as a transition-zone species depending on the cold hardiness of the individual cultivar selected. Most of these cultivars must be propagated vegetatively. Bermudagrass is primarily used for improved or semi-improved areas.

*c. Kentucky bluegrass (Poa partensis).* One of the most widely used grasses in the transition zone, Kentucky bluegrass is popular for lawns and general-purpose areas. It is adaptive to sun or open shade; however, in the southern portions of the transition zone, it prefers cooler, shady areas. Kentucky bluegrass is rather susceptible to disease and in warm, humid regions this susceptibility is increased.

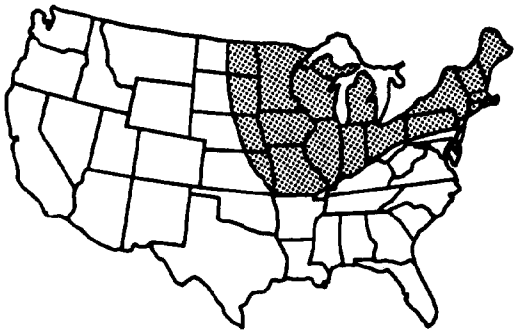
*d. Tall fescue (Festuca arundinacea).* Tall fescue is very adaptive to the transition zone. It is used as a general-purpose turf. In mixtures with Kentucky bluegrass, it should comprise at least 80 percent of the mixture.

*e. Zoysia (Zoysia spp.).* Zoysia is primarily limited to the southern portion of the transition zone. Within these areas, it should be used only in areas with full sun. Meyer zoysia is the most winter hardy species of Zoysia and is, therefore, the most appropriate selection for use in the transition zone. Figures C-3 and C-4 illustrate regional adaptation of turfgrass alternatives.

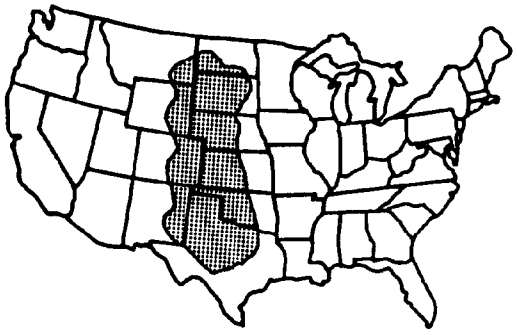


**King Ranch Bluestem**

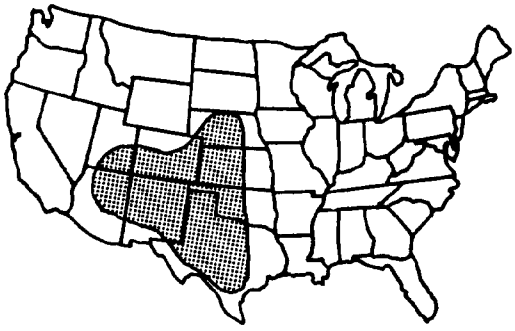
**Little Bluestem**



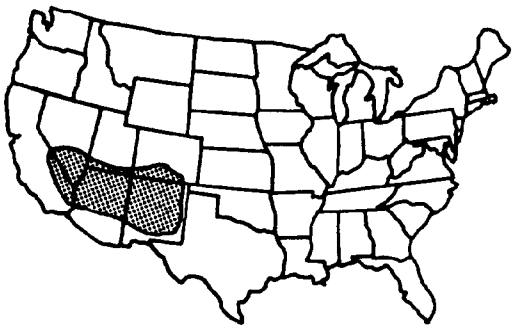
**Smooth Bromegrass**



**Buffalograss**



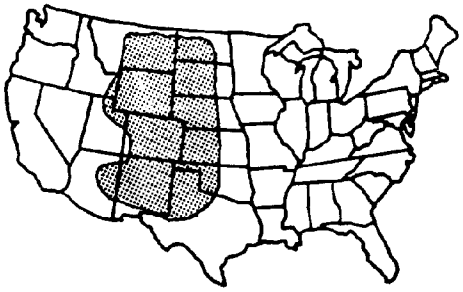
**Sand Dropseed**



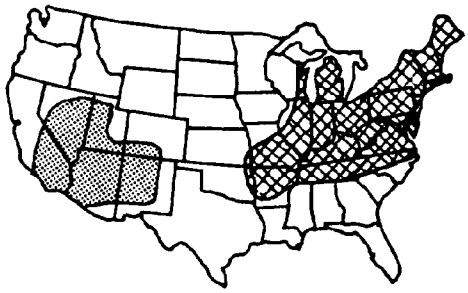
**Galleta**

*Figure C-3. Miscellaneous grasses; turfgrass alternatives.*

Black Grama
Side Oats Grama

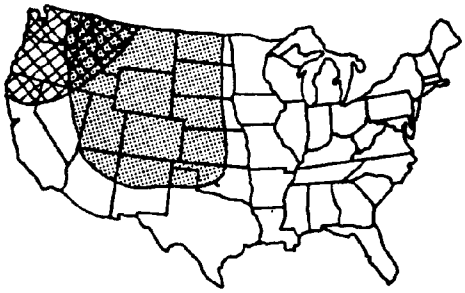


Blue Grama

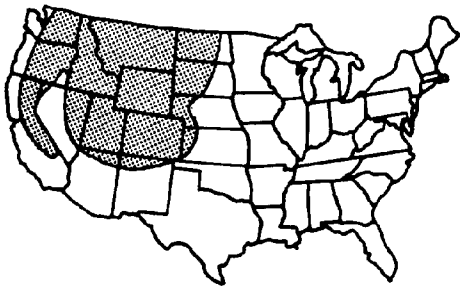


Redtop
Indian Ricegrass

Timothy



Blue-Bunch Wheatgrass
Western Wheatgrass



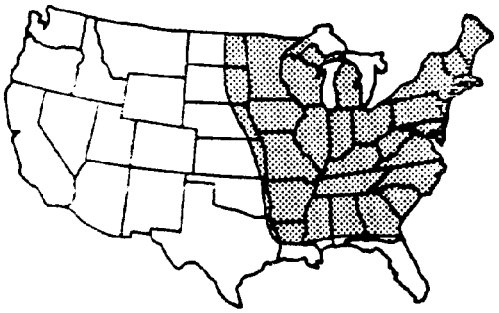
Crested Wheatgrass

*Figure C-4. Miscellaneous grasses continued.*

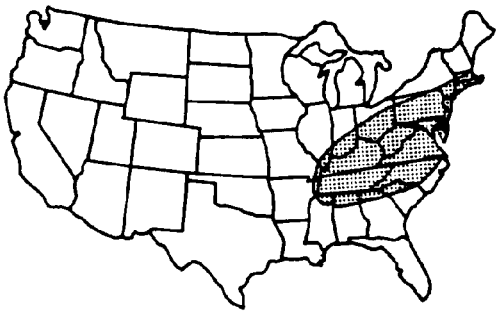
**C-4. Figure C-5 illustrates the regional adaptation of some commonly used turf-grass alternatives.**

**C-5. Computing percent purity.** The percentage of pure live seed for most seed varieties is shown in table C-1. For single, unmixed species, the data presented are normally adequate without further computation. For mixtures of two or more seed kinds, compute as shown in the example in table C-2 for a 50-50 mixture of Kentucky bluegrass and chewings Fescue:

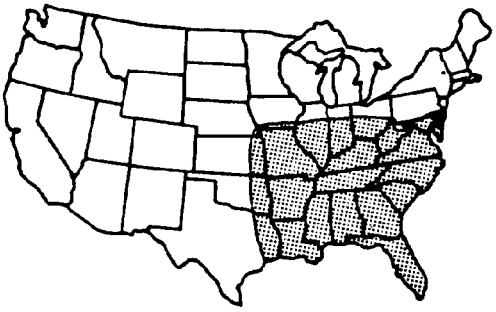
**Alsike Clover**



**White Clover**



**Japanese Honeysuckle**



**Lespedeza**

*Figure C-5. Legumes and groundcovers; turfgrass alternatives.*

*Table C-1. Seeding rates*

| | Pure Live Seed % | Weed Seed % | Seeding Rate, lb. 1000 sq. ft. Ornamental Areas | 1000 sq. ft. Recreational Areas | Acre Functional Areas Embankment | Acre Functional Areas Airfields | Acre Functional Areas Unimproved |
|---|---|---|---|---|---|---|---|
| Bahiagrass, Pensacola | 50 | 0.50 | --- | --- | 2.0 | 30 | 20 |
| Bentgrass | 86 | 0.50 | --- | --- | --- | -- | -- |
| Bermuda, common* | 82 | 1.00 | 1.0 | 2.0 | 1.0 | 30 | 15 |
| Bluegrass, Canada | 64 | 1.00 | --- | --- | 2.5 | 30 | 20 |
| Bluegrass, Kentucky | 68 | 1.00 | 2.5 | 2.5 | 2.5 | 30 | 20 |
| Bluestem, King Ranch | 33 | 2.00 | --- | --- | --- | 30 | 20 |
| Bluestem, little** | 33 | 2.00 | --- | --- | 3.0 | 35 | 25 |
| Brome, smooth | 78 | 1.00 | --- | --- | 3.0 | 30 | 20 |
| Buffalo+ | 46 | 2.00 | 2.0 | 2.0 | --- | 25 | 15 |
| Carpet | 83 | 1.00 | --- | --- | --- | 20 | 20 |
| Centipede | 30 | 1.00 | 0.3 | --- | --- | 5 | 3 |
| Clover, alsike++ | 87 | 1.00 | --- | --- | 0.2 | 2 | 2 |
| Clover, white++ | 86 | 1.00 | --- | --- | 0.2 | 2 | 2 |
| Dropseed, sand | 63 | 1.00 | --- | --- | 1.0 | 25 | 15 |
| Fescue, chewings & red | 78 | 0.50 | 3.0 | --- | 3.0 | 40 | 30 |
| Fescue, tall | 87 | 2.00 | 5.0 | 5.0 | 5.0 | 50 | 35 |
| Galleta** | 15 | 2.00 | --- | --- | 3.0 | 35 | 25 |
| Grama, black**,+ | 9 | 2.00 | --- | --- | 3.0 | 35 | 25 |
| Grama, blue**,+ | 26 | 2.00 | 3.0 | --- | 3.0 | 35 | 25 |
| Grama, side-oats | 30 | 2.00 | --- | --- | --- | -- | -- |
| Indian ricegrass | 45 | 2.00 | --- | --- | 3.0 | 30 | 20 |
| Redtop | 83 | 1.00 | --- | --- | 2.0 | 20 | 15 |
| Ryegrass, annual | 88 | 0.50 | --- | --- | 4.0 | 60 | 40 |
| Ryegrass, perennial | 88 | 0.50 | 4.0 | 4.0 | 4.0 | 60 | 40 |
| Timothy | 89 | 0.50 | --- | --- | --- | 25 | 15 |
| Wheatgrass, bluebunch | 64 | 2.00 | --- | --- | 3.0 | 30 | 20 |
| Wheatgrass, crested | 81 | 1.00 | 4.0 | --- | 4.0 | 30 | 20 |
| Wheatgrass, western | 70 | 2.00 | --- | --- | --- | 30 | 20 |

* Rate based on unhulled seed. Use three-fourths these rates for hulled seeds.
** Data furnished may not be reliable for a specific lot. Seed lot may have much higher or lower purity and germination percents. Adjust seeding rates proportionately.
\+ Rated based on unhulled seed. Use half these rates for hulled seed.
++ Rate based on amount to be used in a seed mixture. Double these rates for pure seeding.

*Table C-2. Mixture rate*

| *Seed Kind* | *Percent Kind by Weight in Mixture* | × | *Percent Pure Live Seed of Each Kind* | = | *Percent Pure Live Seed in Mixture* |
|---|---|---|---|---|---|
| Kentucky bluegrass | 50 | | 68 | | 34 |
| Chewings fescue | 50 | | 78 | | 39 |
| Total pure live seed in mixture, percent | | | | | 73 |
| Other than pure live seed, percent | | | | | 27 |
| | | | | | 100 |